

SN. 10/506,295

ATTORNEY DOCKET NO. MATS:049

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A battery package comprising:

a group of batteries having a plurality of connected secondary batteries, each forming a unit battery;

a plurality of sensors for detecting a temperature and a voltage;

a display device for displaying a condition of the group of batteries;

a switch for controlling charge and discharge of the group of batteries; and

an operational control circuit for generating a signal based on signals input from the plurality of sensors to make the display device display the condition of the group of batteries, and to activate the switch,

wherein the battery package is further provided with a refreshing demand display device for displaying a need to initiate a refreshing charge and discharge if a recovery voltage of the secondary batteries does not exceed a predetermined voltage after a lapse of a predetermined time from a moment when the secondary batteries come to a final discharge voltage.

2. (Currently amended) A battery package comprising:-

~~a group of batteries having a plurality of connected secondary batteries, each forming a unit battery,-~~

~~a plurality of sensors for detecting a temperature and a voltage;-~~

~~a display device for displaying a condition of the group of batteries;-~~

~~a switch for controlling charge and discharge of the group of batteries; and-~~

SN. 10/506,295

ATTORNEY DOCKET NO. MATS:049

~~an operational control circuit for generating a signal based on signals input from the plurality of sensors to make the display device display the condition of the group of batteries, and to activate the switch according to claim 1,~~

wherein the operational control circuit is provided with a non-detecting timer for preventing the sensors from detecting the voltage during a predetermined time period from beginning of the charge,

the operational control circuit counts a number of times that the voltage of the batteries exceeds a preset voltage within the predetermined time period, and

further wherein the battery package is provided with a refreshing demand display device for displaying a need to initiate a refreshing charge and discharge when the counted number reaches a predetermined number.

3. (Currently amended) A battery package comprising:-

~~a group of batteries having a plurality of connected secondary batteries, each forming a unit battery;~~

~~a plurality of sensors for detecting a temperature and a voltage;~~

~~a display device for displaying a condition of the group of batteries;~~

~~a switch for controlling charge and discharge of the group of batteries; and~~

~~an operational control circuit for generating a signal based on signals input from the plurality of sensors to make the display device display the condition of the group of batteries, and to activate the switch according to claim 1.~~

wherein the operational control circuit is provided with a non-detecting timer for preventing the sensors from detecting the voltage during a predetermined time period from beginning of the charge,

the operational control circuit counts a number of times that the voltage of the batteries exceeds a preset voltage within the predetermined time period, and or

SN. 10/506,295

ATTORNEY DOCKET NO. MATS:049

further wherein the battery package is further provided with a refreshing demand display device for displaying a need to initiate a refreshing charge and discharge in any of events that the counted number reaches a predetermined number, and a recovery voltage of the batteries does not exceed a predetermined voltage after another predetermined time has elapsed from a moment when the batteries come to a final discharge voltage.

4. (Original) The battery package according to one of claim 1 and claim 3, wherein the refreshing demand display device displays a need to initiate the refreshing charge and discharge if the recovery voltage of the secondary batteries does not exceed 1.15 volt after one day or longer time has elapsed from the moment when the batteries come to the final discharge voltage.

5. (Previously presented) The battery package according to one of claim 1 to claim 3, wherein each of the secondary batteries comprises an alkaline storage battery provided with a positive electrode mainly composed of a nickel oxide, a negative electrode, a separator, and an alkaline electrolyte.

6. (Original) The battery package according to claim 5, wherein the negative electrode comprises a hydrogen storage alloy.

7. (Original) The battery package according to one of claim 1 to claim 3, wherein the temperature sensor for detecting temperature detects a temperature of the secondary batteries, and the operational control circuit computes a rate of temperature change according to the detected temperature, and generates and delivers a signal for terminating the charge to the switch for controlling the charge and discharge of the group of batteries, when the rate of temperature change exceeds a preset range.

8. (Currently amended) A method of charging and discharging a battery in a battery package, the battery package comprising:

a group of batteries having a plurality of connected secondary batteries, each forming a unit battery;

a plurality of sensors for detecting a temperature and a voltage;

SN. 10/506,295

ATTORNEY DOCKET NO. MATS:049

a display device for displaying a condition of the group of batteries;

a switch for controlling charge and discharge of the group of batteries; and

an operational control circuit for generating a signal based on signals input from the plurality of sensors to make the display device display the condition of the group of batteries, and to activate the switch, and

the method comprising ~~the step of carrying out a refreshing charge and discharge if a recovery voltage of the secondary batteries does not exceed a predetermined voltage after a predetermined time has elapsed from a moment when the batteries come to a final discharge voltage.~~

9. (Currently amended) A method of charging and discharging a battery in a battery package, ~~the battery package comprising:-~~

~~a group of batteries having a plurality of connected secondary batteries, each forming a unit battery;-~~

~~a plurality of sensors for detecting a temperature and a voltage;-~~

~~a display device for displaying a condition of the group of batteries;-~~

~~a switch for controlling charge and discharge of the group of batteries; and~~

~~an operational control circuit for generating a signal based on signals input from the plurality of sensors to make the display device display the condition of the group of batteries, and to activate the switch, and~~

according to claim 8, the method comprising the steps of:

preventing the sensors from detecting the voltage by means of a non-detecting timer provided in the operational control circuit;

counting a number of times in which the voltage of the batteries exceeds a preset voltage within a predetermined time period by means of the operational control circuit; and

SN. 10/506,295

ATTORNEY DOCKET No. MATS:049

carrying out a refreshing charge and discharge when the counted number reaches a predetermined number.

10. (Currently amended) A method of charging and discharging a battery in a battery package, ~~the battery package comprising:-~~

~~a group of batteries having a plurality of connected secondary batteries, each forming a unit battery;-~~

~~a plurality of sensors for detecting a temperature and a voltage;-~~

~~a display device for displaying a condition of the group of batteries;-~~

~~a switch for controlling charge and discharge of the group of batteries; and~~

~~an operational control circuit for generating a signal based on signals input from the plurality of sensors to make the display device display the condition of the group of batteries, and to activate the switch, and according to claim 8.~~

the method comprising the steps of:

preventing the sensors from detecting the voltage by means of a non-detecting timer provided in the operational control circuit;

counting a number of times in which the voltage of the batteries exceeds a preset voltage within a predetermined time period by means of the operational control circuit; and

carrying out a refreshing charge and discharge in any of events that the counted number reaches a predetermined number, and a recovery voltage of the batteries does not exceed a predetermined voltage after another predetermined time has elapsed from a moment when the batteries come to a final discharge voltage.

11. (Currently amended) The method of charging and discharging a battery according to one of claim 8 and claim 10, comprising ~~the step of~~ carrying out the refreshing charge and discharge if the recovery voltage of the secondary batteries does not exceed 1.15

SN. 10/506,295

ATTORNEY DOCKET NO. MATS:049

volt after one day or longer time has elapsed from a moment when the batteries come to the final discharge voltage.

12. (Currently Amended) The method of charging and discharging a battery according to one of claim 8 to claim 10, further comprising the steps of charging the battery up to 90 to 120% of an initial capacity with a current of 5.0-It or less, and further charging up to 150 to 200% with a current of 2.0-It or less for a given duration controlled by the timer function provided in the operational control circuit during the refreshing charge and discharge, where "It" denotes a rated battery capacity.

13. (Currently Amended) The method of charging and discharging a battery according to one of claim 8 to claim 10, further comprising the steps of detecting a temperature of the secondary batteries with the sensor, computing a rate of temperature change according to the detected temperature by means of the operational control circuit, and delivering a signal for termination of the charge to the switch for controlling the charge and discharge of the group of batteries when the rate of temperature change exceeds a preset range.

14. (Original) The method of charging and discharging a battery according to claim 13, wherein the rate of temperature change is preset to a range of 0.5 and 4.0 °C/min.

15. (Original) The method of charging and discharging a battery according to claim 14, wherein the rate of temperature change is preset to a range of 1.0 and 3.0 °C/min.

16. (Currently amended) The method of charging and discharging a battery according to one of claim 8 to claim 10, comprising the step of carrying out charge and discharge by any of a constant-current charging and discharging method, a constant-voltage charging and discharging method, and a combination of the constant-current charging and discharging method and the constant-voltage charging and discharging method.

17. (New) The battery package according to claim 1, wherein the refreshing demand display device displays a need to initiate a refreshing charge and discharge if a recovery voltage of the secondary batteries does not exceed a predetermined voltage after a lapse of a predetermined time from a moment when the secondary batteries come to a final discharge voltage.

SN. 10/506,295

ATTORNEY DOCKET NO. MATS:049

18. (New) The method of charging and discharging a battery according to one of claim 8, wherein the method carries out a refreshing charge and discharge if a recovery voltage of the secondary batteries does not exceed a predetermined voltage after a predetermined time has elapsed from a moment when the batteries come to a final discharge voltage.